



**Intergovernmental Coordination
Group for the Tsunami Early
Warning and Mitigation System
in the North-eastern Atlantic,
the Mediterranean and connected
seas (ICG/NEAMTWS)**

Seventh Session

Paris, France

23–25 November 2010

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ICG/NEAMTWS-VII/3
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English only^{*}

^{*} An Executive Summary of the report is available as a separate document in Arabic, English, French, Spanish and Russian (ICG/NEAMTWS-VII/3s)

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1 OPENING

1 The seventh session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS-VII) was opened on Tuesday 23 November 2010 at 10:00 by François Schindelé, Chairman of ICG/NEAMTWS, who welcomed the participants to the meeting.

2 Wendy Watson-Wright, Assistant Director-General, UNESCO, and Executive Secretary, IOC, welcomed participants to the meeting. She drew attention to the need to adopt common rules and standards.

2 ORGANIZATION OF THE SESSION

2.1 ADOPTION OF THE AGENDA

3 The Chairman of the ICG/NEAMTWS introduced the provisional Agenda prepared by the Secretariat in coordination with the Officers. The Session adopted the Provisional Agenda, included in [Annex I](#).

2.2 DESIGNATION OF THE RAPPORTEUR

4 According to Rule of Procedure no. 25.4, the meeting considered the designation of a Rapporteur. Turkey, seconded by Portugal, proposed the UK as rapporteur. Mr Russell Arthurton was designated by his delegation as rapporteur and was approved by acclamation.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

5 The Chairman reviewed the timetable for the meeting and it was adopted. The Chairman also introduced the documentation for the meeting ([Annex III](#)).

2.4 ESTABLISHMENT OF SESSIONAL COMMITTEES AND WORKING GROUPS

6 The ICG discussed the formation of open-ended sessional committees and working groups in order to ease the working in plenary, as well as to facilitate and promote the exchange of information. The following open-ended sessional drafting groups were established:

- Drafting Group on Decisions and Recommendations
- Drafting Group on the Task Team on the Architecture of the Tsunami Warning System
- Drafting Group on the Task Team on Communication Test and Tsunami Exercises
- Drafting Group on the Task Team on the Areas of Responsibilities
- Drafting Group on the Multi-hazard Approach

7 Working Group 1 on Hazard Assessment and Modelling and Working Group 4 on Public Awareness, Preparedness and Mitigation had short sessional meetings.

Drafting Group on the Task Team on Communication Test and Tsunami Exercises

8 The report of the Drafting Group on the New Terms of Reference for the Task Team on Communication Tests and Tsunami Exercises was presented by the Chairman, Mr Luis Matias.

9 The Drafting Group recommended that a new Task Team on the Communication Test and Tsunami Exercises replaced the Task Team on Communication Test Exercises established by the ICG at the seventh session.

10 France questioned whether Tsunami National Contacts should be involved as well as TWFPs. Mr Matias agreed to the proposal.

11 Portugal offered manpower support, and JRC offered to provide a venue for the proposed workshop.

12 **The ICG established** the task Team on the Communication Test and Tsunami Exercises, whose terms of reference are detailed in [Annex II.B](#).

Drafting Group on the Task Team on the Architecture of the Tsunami Warning System

13 The report of the Drafting Group on the Revised Terms of Reference of the Task Team on the Regional Tsunami Warning System Architecture was presented by the Co-Chairman, Mr Trevor Guymer.

14 The Drafting Group proposed the continuation of the work of the Task Team for the next intersessional period.

15 **The ICG extended** the mandate of the Task Team on the Architecture of the Tsunami Warning System, which terms of reference are detailed in [Annex II.A](#).

Drafting Group on the Task Team on the Areas of Responsibility

16 ICG Vice-Chairperson Maria Ana Baptista reported on the Drafting Group on Areas of Responsibility, stating that no agreement had been reached and that the group had decided that the issue of Areas of Responsibility should be passed back to the ICG.

17 Mr Guymer in his capacity of co-chairman of the Architecture TT explained there was a need to clarify a misunderstanding on this issue in the report of its last meeting. The issue was never formally agreed. It was important that a form of words was included but the Development Plan was not an appropriate place.

18 Greece observed that there was a consensus in the WG discussion for a draft Plan with the Annex.

19 The Chairperson declared that the Architecture TT should continue work on the draft, reviewing and taking into account the existing confusion and proposing an acceptable Development Plan.

20 Italy said that this should be included as a priority topic for the Architecture TT.

21 France observed that there was no difficulty in the western part of the region. It would be a pity if the process was stuck. France was expecting a compromise solution at the next ICG.

22 UK recalled that there is no problem in NE Atlantic, nor in Western and Central Mediterranean while agreement across the whole region is required. It raised the question of the understanding of the term "Areas of Responsibility". It proposed a focus on impact areas rather than source areas – concern for the MS that would be affected by a tsunami. It was proposed there should be "service provision", with MS having the opportunity to choose from which service providers (RTWC) to receive watch messages from, even more than one. The UK enquired whether the references in the documentation could take account of this, taking the focus off waters under national jurisdiction and supported France's concern.

23 Portugal also supported France and the UK.

24 Greece stated that for its part it had fully cooperated with the aims of the Architecture TT in respect of Areas of Responsibility and had always been ready to discuss this issue.

- 25 Turkey supported the arguments and views put forward by UK, France and Portugal, and agreed that these should be discussed in the Architecture TT.

Drafting Group on the Multi-hazard Approach

- 26 Trevor Guymer reported on the sessional drafting group on the multi-hazard approach, which proposed the establishment of a task team addressing the multi-hazard approach to coastal inundation.

- 27 **The ICG established** a Task Team on the Multi-hazard Approach to Coastal Inundation, whose terms of reference are detailed in [Annex II.C](#).

Working Group 1 - Hazard Assessment and Modelling

- 28 Jörn Behrens, Co-Chairman of WG1, presented the report on the sessional meeting, which finalized the revision of the Decision Matrix for the Mediterranean.

Working Group 4 - Public Awareness, Preparedness and Mitigation

- 29 Russell Arthurton, Co-chairman of WG4 presented the report on the sessional meeting. He explained that the major output of the WG4 since the last ICG was the Guidance Manual describing and explaining the end-to-end NEAMTWS for Civil Protection authorities. Subject to adoption by the ICG the document should be available early next year.

- 30 The group acknowledged the participation of WG1 in the Guidance document. Also the contribution of the SCHEMA project. A brief presentation on SCHEMA was given by the project coordinator, Richard Guillaude.

- 31 The role of the WG4 in the NEAMTIC was discussed, including media and training aspects.

- 32 The group agreed to consider a proposal to merge with WG1 and to discuss this proposal during the intersessional with the drafting of new terms of reference for decision at the next ICG.

3 REPORTS ON ICG/NEAMTWS INTERSESSIONAL ACTIVITIES

3.1 REPORT BY THE CHAIRMAN

- 33 The Chairman reviewed some of the major results since ICG/NEAMTWS-VI. He noted that NEAM was the only region still without any active National Tsunami Warning Centre (NTWCs) and Regional Tsunami Watch Centres (RTWCs). However, by 2011-2013 there would be several NTWCs implemented, some with regional (watch) capabilities.

- 34 UK questioned the effectiveness of the ICG in absorbing the outputs of external initiatives such as SCHEMA and TRANSFER. For SCHEMA, the Chairman informed that handbooks would shortly be available. The Co-Chair informed that TRANSFER outputs were under review, awaiting permission from the EC to publish. The Secretariat indicated that links to such outputs would be posted on the IOC Tsunami website.

3.2 REPORT BY IOC SECRETARIAT

- 35 The Secretariat reported on the activities conducted during 2010 to support the ICG/NEAMTWS. The Secretariat supported the organization of the meetings of the Task Team on the Regional Tsunami Warning System Architecture (Paris, 18–19 March and 7–8 October 2010), as well as the meetings of the Task Team on the Tsunami Communication Test (Paris, 19 March and 8 October 2010).

- 36 The Secretariat provided an update on the status of nominations of the Tsunami National Contacts (TNCs) and Tsunami Warning Focal Points (TWFPs). As of 19 November 2010, ICG/NEAMTWS Members have nominated 26 TNCs and 24 TWFPs (the full list is given in [Annex V](#)). Through Circular Letters, the Secretariat periodically invites Member States that have not nominated TNCs and TWFPs to do so.

3.3 REPORT BY TOWS-WG

- 37 The Secretariat reported on the results of the third meeting of the Working Group on Tsunami and Other Hazards related to Sea-Level Warning and Mitigation Systems (TOWS-WG-III, Lisbon, 5–6 May 2010). The recommendations by the TOWS-WG-III included the following:

The group agreed that the performance and capacity of delivery of GTS for tsunami purposes needs to be addressed by WMO.

The group agreed on the need of having the Compendium of Terms and Definitions in Coastal Disaster Risk Reduction as a self contained document that will include basic as well as specialized concepts to serve as a reference document.

The group agreed that IOC should raise the data requirement at the policy level to demonstrate the need for real time data directly to governments, rather than at IOC governing bodies only. The group agreed to focus on real-time data, emphasizing that for tsunami warning timeliness is more important than precision or data quality.

The group agreed in respect of Tsunami related Data Exchange aspects to ask ICGs to provide sensitivity studies about data available/not available for tsunami warning systems within three months and establish a TOWS-WG Task Team to synthesize the results of the studies provided by the ICGs.

The group also agreed to solicit from IODE a report on implementation of the IOC Oceanographic Data Policy indicating which data type is less or not fully exchanged, in particular on sea level. It further agreed to solicit from CTBTO to provide similar analysis for seismic data.

The group recommended to raise to the highest levels the need for free data exchange for tsunami warning purposes, through bilateral meetings or when and if possible by IOC Executive Secretary, based on the above requested documentation yet to be developed.

The group also recommended that IOC heighten its advocacy for real-time data exchange in order to confirm as soon as possible that a tsunami is generated or not so that Member States can save lives. The tsunami centres should receive and process these data in real time to measure the tsunami wave's amplitude. No automatic quality control is required from the data provider or at the tide station. The absolute value is not required to detect a tsunami, but relative fast variations of signal.

The group agreed that the Task Team on Sea Level should look at the ICGs Implementation Plans to guide them on how to design the systems. It should also look into maintenance issues. The Task Team should characterize how and with which criteria the core networks are designed in each TWS.

The group also agreed that all data from the core network of sea level stations should be available to all members, in compliance of the IOC Data Exchange Policy.

The group agreed to recommend a joint meeting of Inter-ICG Task Teams in the second half of 2010, preferably in September, with India and USA as potential hosts, pending definition of dates and funding arrangements, in coordination with the Secretariat. The Secretariat was requested to circulate information on WMO/CBS evaluation process.

The group agreed to reaffirm the value of a multi-hazard approach to maintaining a vital tsunami warning system at local, national and regional levels.

3.4 REPORT BY THE WORKING GROUPS AND TASK TEAMS

38 Noting the revised terms of reference for the Working Groups 1-4, adopted at ICG/NEAMTWS-VI, the Chairman invited the Chairpersons of the Working Groups to comment on progress achieved during the Intersessional period with respect to the Recommendations of NEAMTWS-VI and the tasks assigned to them in the Implementation Plan. The reports on the Intersessional activities of the Working Groups are included in [Annex IV](#).

Working Group 1 - Hazard Assessment and Modelling

39 Jörn Behrens, Co-Chairman of WG1, presented the WG1 report also on behalf of the Co-Chairman, Mauricio González. Among the achievements were a revision of the Decision Matrix for the Mediterranean, and a contribution to the Working Group 4 Guidance Manual.

40 Portugal questioned whether such a revision would apply also to the North-eastern Atlantic. It was agreed that it would. But J. Behrens stressed that this was a working document and thus subject to continuing revision.

Working Group 2 - Seismic and Geophysical Measurements

41 Alexander Rudloff on behalf of Guilio Selvaggi and Winfried Hanka, Co-Chairs of WG2, presented the working group report of the intersessional period.

42 The Working Group made a request that it should freeze its activity for the coming year, with an option to resume at the next ICG.

43 Interventions by Lebanon and Greece concerned the development of national networks. It was questioned whether these could be enhanced with help from other countries, such as Germany and Italy. Lebanon informed that in the Eastern Mediterranean seismic network is still incomplete, especially local networks. Greece commented that several national networks exist whose data have been acquired by the "Centre Sismologique Euro-Méditerranéen"; European-Mediterranean Seismic Centre (CSEM/EMSC): some modules for data acquisition and exchange (parametric data and alert data) could be improved with the assistance of Germany and Italy.

44 Ireland informed that four new broadband stations had been added to its network.

Working Group 3 - Sea Level Data Collection and Exchange, Including Offshore Tsunami Detection and Instruments

45 Dov Rosen, the Co-Chairman, presented the WG3 report also on behalf of Co-Chair, Ms Begoña Pérez. He described the status of the core-regional sea-level network for NEAMTWS, including GTS tests for sea-level data transmission, documents and reports, offshore instrumentation, and far field information.

46 Turkey stated that it was ready to share tide gauge data pending a few technical issues.

47 Portugal enquired whether there was a proposal to develop a data access service. The Secretariat said that this would be developed over the next few months.

48 Monaco informed that its new sea-level station was now in place and would be providing data within a few weeks.

49 A representative of the EC Joint Research Centre (JRC) said that it planned to ensure continuous data availability.

50 Regarding data from Ostend, improvements with back-up servers in different time-zones are planned but there is no prospect of a single 24/7 manned service centre yet.

Working Group 4 - Public Awareness, Preparedness and Mitigation

51 Russell Arthurton, Chairman of WG4, presented the WG4 report also on behalf of the Co-Chairman, Stefano Tinti. A Guidance Manual for Civil Protection Authorities in respect of tsunami risk assessment and mitigation, entitled "Reducing and Managing the Risk of Tsunamis", has been completed to Second Draft. The draft, which incorporates responses to comments from a comprehensive review of the First Draft by UN/ISDR, is available as a background document to the meeting website. The Working Group has liaised with counterpart groups in the other ICGs covering Disaster Preparedness and Mitigation through the TOWS-WG and its Task Teams. It has contributed to the Task Team on the Regional TWS Architecture, including revision of the Interim Operational Users Guide.

52 Turkey expressed its appreciation to the WG especially in view of the end-user requirement. The document would prove useful in explaining the science to civil protection agencies. The Chairperson agreed that the involvement of the civil protection authorities was now very important.

53 Lebanon said that it was important also to recognize the role of NGOs such as the Red Cross/Crescent in multi-hazard management.

Task Team on the Regional TWS Architecture

54 Trevor Guymer, Co-Chairman of the Task Team on Regional Tsunami Warning System (TWS) Architecture, provided, also on behalf of the Co-Chairman, Gerassimos Papadopoulos, a combined report on the results of the fifth (Paris, 18–19 March 2010) and sixth (Paris, 7–8 October 2010) meetings of the Task Team. He noted that attendance at these meetings was mainly from representatives of candidate RTWCs. In presenting a resume of these meetings, he noted that there was a lack of consensus on areas of responsibility of the RTWCs. As an interim solution he suggested a concept of a network of national centres willing to participate in the exchange of tsunami alert information. The question of areas of responsibility was beyond the mandate of the task team. Changes to the draft Operational Users Guide were discussed and put in place. The activities of the ad hoc group on multi-hazards were kept under review and a new task team dedicated to this issue was proposed. This would be of particular interest to northern European States.

55 It was decided that there was seen to be a continuing need for the task team during the coming intersessional, though there might be a need to adjust the mandate.

56 Turkey expressed its appreciation of the work done in respect of the Development Plan.

57 Greece and France expressed their support for a Task Team on Areas of responsibility.

58 Israel requested that the option for possible future RTWCs should be kept open.

Task Team on Communication Test Exercises

59 Luis Matias, Chairman of the Task Team on Communication Test Exercises, provided a report on the results of the first (Paris, 19 March 2010) and second (Paris, 8 October 2010) meetings of the Task Team.

60 Turkey acknowledged the work done by Luis Matias in organising the Test Exercise but inquired what scale was envisaged for future exercises. Mr Matias responded suggesting beginning with the preparation of an exercise involving NTWCs and TWFPs. The Chairman agreed that there were different steps to be taken leading up to any major exercise.

61 Mr Matias suggested that the mandates of the task team might need to be revised.

3.5 REPORTS BY OTHER INTERGOVERNMENTAL ORGANIZATIONS

62 A report on activities by the European Commission was presented by Alessandro Annunziato from the Joint Research Centre of the European Commission (JRC).

63 The resume covered the role and scope of the MIC (Monitoring and Information Centre) of ECHO. He noted that the MIC would be financing the NEAMTIC initiative (Agenda item 4.2).

64 The Research and Development Directorate General had been instrumental in promoting a number of tsunami-related research projects – NEAREST, TRANSFER, SEA HELLARC, SAFER. There was a need for working groups to identify knowledge gaps and research needs so that these could be fed into future research initiatives.

65 The role of the JRC was explained, including the Tsunami Calculation Grid, the development of the Tsunami Analysis Tool, the Tsunami Alerting Device (which can respond to sea-level data input to provide public screen announcements).

66 The Representative of JRC said it was collaborating with Portugal in the development of their national early warning system.

67 Israel expressed its concern about tsunamis caused by landslides, especially in the eastern Mediterranean.

68 Greece was concerned about warnings for near-field events, especially the need for public education.

69 Portugal enquired whether large-scale exercises might be funded through the MIC.

4 IMPLEMENTATION

4.1 ESTABLISHMENT OF RTWCs and NTWCs

70 Member States reported on the status of the establishment of their NTWCs and the offers to host RTWCs.

Germany

71 Alexander Rudloff renewed the offer of support to the ICG by GFZ in respect of seismic monitoring.

72 Germany repeated its offer – as agreed on at the ICG/NEAMTWS-IV in Lisbon – to act as a Seismic Background Centre for Regional Tsunami Early Warning, based on prioritized earthquake information messages via E-Mail and SMS. The information will rely on the GEOFON automated earthquake information system and specifically filtered for potentially tsunamigenic events limited to the NEAMTWS region. This service is exclusively offered to nominated TWFPs and TNCs of ICG/NEAMTWS Member States. Interests should be notified to the IOC/ICG-NEAMTWS Secretariat.

- 73 Germany informed delegates on the latest Mentawai Island/Indonesia earthquake and subsequent tsunami of 25 October 2010. Readings from tides gauges and tsunami buoys as well as a timeline of the warning distribution by Indonesia were shown. A special issue publication of the overall activities from the GITEWS project is available from "Natural Hazards and Earth System Sciences". GFZ is involved in the coordination of two new FP7 projects, related to natural hazards and multi-risk assessment, called TRIDEC and MATRIX.

Greece

- 74 Nicolas Melis reviewed the current state of development in Greece, noting that its NTWC exists as a 24/7 service with links to the civil protection operational centre and in terms of earthquake parameters real-time links to INGV and GFZ. So far two earthquake detection software solutions (SeisComp3 and Earthworm) are implemented. The national seismic and sea-level networks are constantly upgraded.

Turkey

- 75 Ms Nurcan Meral-Ozel reported on the recent improvements in the instrumentation networks linked to national warning system as well as the technical facilities at the national earthquake and tsunami warning centre at KOERI. The Government of Turkey approved one million Euro for establishing a new earthquake and tsunami warning centre in a new building next to KOERI. She informed the group that Turkey would be ready to operate as a NTWC in early 2011.

France

- 76 Bernard Deleplanque from the French Directorate of Civil Protection reported on the multi agency (including CEA, SHOM and CNRS) setting up of the French tsunami warning centre for the western Mediterranean Sea and the NE Atlantic – CENALT and the recent progress reached. CENALT's target is to provide tsunami warnings within 15 minutes. By detailing the timeline of the project he stated that the centre would be operational by mid 2012.

Israel

- 77 Dov Rosen reported on activities including the simulation of tsunami events, showing modelling outputs from a potential earthquake Mw 8.3 off Crete and a landslide-generated tsunami off Haifa to prove Israel is seriously considering the risk.

Portugal

- 78 Fernando Carrilho reported on the implementation of the NTWS which now operates nationally 45 broadband and 28 short-period seismic stations. He acknowledged the collaboration with JRC mainly for the Tsunami Analysis tool and with GFZ for the SeisComp3 software. Mr Carrilho reported that the Meteorological Institute is the national TWFP and already operating on a 24/7 basis. However, in collaboration with the civil protection authority the official nomination as the NTWC is still pending (expected in 2011), due to an awaited decision on the required funding. Sea-level monitoring was still incomplete. Work will continue in building the NTWC throughout 2011 leading to a RTWC role for the NE Atlantic.

Morocco

- 79 The Chairperson reported that Morocco was ready to participate in the NEAMTWS.

4.2 TSUNAMI INFORMATION CENTRE (NEAMTIC)

- 80 The secretariat reported that in cooperation with the Commissariat à l'Energie Atomique et aux énergies alternatives (CEA) (France), the National Observatory of Athens (NOA)

(Greece), the Dipartimento della Protezione Civile (DPC) (Italy), and the Fundação da Faculdade de Ciências da Universidade de Lisboa (FFCUL) (Portugal), a project proposal was submitted to the European Commission (EC), Directorate-General (DG) for Environment, European Civil Protection (now under ECHO) for the establishment of a Tsunami Information Centre for the Euro-Mediterranean region. The proposal was recently approved for funding. During 2011–2012, the NEAMTIC will undertake the following tasks:

- Development and distribution of educational, awareness and preparedness materials, event data collection, and the fostering of research and its application to prevent loss of life and property from tsunamis and other sea-level related hazards;
- Identification and exchange of good practices and assistance to civil protection authorities in the establishment of national and regional warning systems on coastal inundation, and the reduction of risks from tsunamis and other sea-level related hazards through comprehensive mitigation programmes, including integrated coastal zone management;
- Provision of information on warning systems for tsunamis and other sea-level related hazards to civil protection authorities, on the mandate and activities of the European Commission and the IOC in the field of tsunami preparedness, and on how to become active participants in those processes.

81 The project is partly financially supported by the German Ministry of Education and Research (BMBF). The NEAMTIC will produce materials in English, French, Greek, Italian and Portuguese, as well as Turkish, based on a collaboration with the Kandilli Observatory and Earthquake Research Institute (KOERI). The Islamic Scientific, Educational and Cultural Organization (ISESCO) will support the Arabic translation. The support of Spain for Spanish translations is being sought.

4.3 UPDATE OF NEAMTWS GUIDING DOCUMENTS

82 Trevor Guymer, Co-chairman of the Task Team on the Regional Tsunami Warning System Architecture presented an update on the guiding documents for the NEAMTWS.

83 He stressed that the Operational Users Guide as a living document should be adopted at every ICG session. This allows keeping the Operational Users Guide up to date with the development and establishment of NTWCs willing to share their data and RTWCs.

84 He announced that the UK will not establish a NTWC on its own but relies on Portugal as RTWC. Germany will also not establish a fully fledged NTWC but is interested to receive watch information from other regional centres e.g. to protect their tourists.

85 France engaged in an operation based on the concept of RTWCs and supports the view of UK. Germany reminded that the RTWCs are expected to provide watches and not warnings.

86 After an intensive and controversial debate and numerous interventions from several Member States no common agreement could be reached on the NEAMTWS Development Plan in the existing form, neither with nor without the mainly discussed annex. With the basic agreement to rather address “regional tsunami watch services” instead of areas of responsibility or origin, the Task Team on TWS Architecture was asked to work on this issue in the intersessional period and produce a reworked consensus document to be adopted by the next ICG session.

5 PROGRAMME FOR 2011

87 The Secretariat presented the activities foreseen for the NEAMTIC project in 2011. The chairpersons of the working groups and task teams were invited to submit within January 2011 a plan of activities for 2011 to the Secretariat.

5.1 ACTIVITIES SCHEDULED FOR 2011

88 Based on the plans of activities submitted by the chairs of the working groups and tasks teams the Secretariat will compile and consolidate a plan of activities for 2011.

5.2 ESTABLISHMENT OF INTERSESSIONAL WORKING GROUPS AND TASK TEAMS

89 The Secretariat raised the possibility of merging Task Teams where possible.

90 Italy and Germany did not support merging the Task Team on the Regional TWS Architecture and the Task Team on Communication Tests but rather to have meetings back-to-back, while the Task Team on the Multi-hazard Approach will meet for the first time.

6 DATE AND PLACE FOR ICG/NEAMTWS-VIII

91 Spain offered to host the Eight Session of ICG/NEAMTWS in Santander on 23–25 November 2011. **The ICG welcomed** the offer by Spain and **agreed**.

7 ANY OTHER BUSINESS

92 No other business was required to be considered by the Session.

8 ADOPTION OF DECISIONS AND RECOMMENDATIONS

93 The meeting discussed the draft decisions and recommendations from the plenary and the working groups prepared by the Secretariat. The adopted version is included in [Annex II](#).

9 CLOSING

94 The Chairman closed the meeting closed on Thursday 25 November 2010, at 13:00.

ANNEX I

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ANNEX II

DECISIONS AND RECOMMENDATIONS

The Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS),

Having met for its 7th Session in Paris, France, 23—25 November 2010,

Having reviewed the progress made in the implementation of the NEAMTWS,

Taking into account the recommendations of the 3rd meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG-III) (Lisbon, Portugal, 5–6 May 2010), adopted by the 43rd IOC Executive Council,

Having considered also IOC Resolution EC-XLIII.6 on Global Coordination of Early Warning and Mitigation Systems for Tsunamis and Other Sea-level-related Hazards and its request to ICGs to provide TOWS-WG as soon as possible the results of an analysis of the impact of data gaps on the tsunami detection and forecast timeliness and accuracy,

Noting the reports of the Working Groups and the Task Teams of the Regional Tsunami Warning System as well as its draft Operational Users Guide and draft NEAMTWS Development Plan,

Noting the need for all the Members of the ICG to nominate their Tsunami National Contacts (TNCs) and Tsunami Warning Focal Points (TWFPs) and to provide tsunami forecast points,

Noting furthermore the positive results of the first two communication tests conducted by the candidate Regional Tsunami Watch Centres (RTWCs) in 2010,

Noting with satisfaction the approval by the European Commission of the project proposal concerning the Tsunami Information Centre for the North-eastern Atlantic, the Mediterranean and Connected Seas (NEAMTIC) at the IOC Secretariat for the ICG/NEAMTWS,

Re-emphasizing the urgency of having the NEAMTWS operational in an interim phase as soon as possible and the need to define the architecture of the system to be approved at the next session of the ICG,

Noting the progress made by some Member States in setting up National Tsunami Warning Centres (NTWCs) and RTWCs,

Emphasizes the need to link tsunami warning and preparedness with other types or related coastal inundation within a multi-hazard approach;

Acknowledges the IOC Sea Level Station Monitoring Facility as hosted by the Flanders Marine Institute (Ostend, Belgium), and **notes** its importance for the interim provision of data to NEAMTWS' NTWCs; **Encourages** IOC to develop national capacities for real-time quality control and to arrange a direct data transmission capability from this facility to NTWCs and establish a back-up system;

Encourages Member States' data centres to make sea-level data available in real time to NTWCs, e.g. through the Global Telecommunication System (GTS);

Acknowledges the offer by the German Research Centre for Geosciences (GFZ) to provide to TWFPs and TNCs of NEAMTWS Member States a prioritized automatic earthquake information service on demand and invites NEAMTWS members to apply for such a service through the IOC Secretariat;

Confirms the structure of the working groups for the intersessional period:

- Working Group 1 on Hazard Assessment and Modelling
- Working Group 2 on Seismic and Geophysics Measurement
- Working Group 3 on Sea Level Data Collection and Exchange, Including Offshore Tsunami Detection and Instruments
- Working Group 4 on Public Awareness, Preparedness and Mitigation;

Supports the idea that Working Groups 1 and 4 have agreed to consider merging their operations in principle with the priority for the intersessional period to pursue this objective;

Extends the mandate of the Task Team on the Regional Architecture of the Tsunami Warning System until the next session of ICG/NEAMTWS with modified Terms of References as detailed in Annex II.A;

Establishes a Task Team on Communication Test and Tsunami Exercises for the next intersessional period with the Terms of References detailed in Annex II.B;

Establishes a Task Team on the Multi-hazard Approach to Coastal Inundation in NEAMTWS, whose Terms of Reference are detailed in Annex II.C;

Decides to conduct during 2011 Communication Test Exercises involving the TWFPs and to set up procedures for the first NEAM tsunami exercise to be conducted in 2012;

Adopts the Operational Users Guide, including the revised decision matrix, to guide the Tsunami Exercises, and to be reviewed and updated, if necessary, at ICG/NEAMTWS-VIII;

Welcomes the draft document “Reducing and Managing the Risks of Tsunamis” produced by Working Group 4 and requests that it should be made available to the other ICGs and TOWS-WG;

Requests Member States to:

- nominate or verify both TWFPs and TNCs, if they have not done so,
- ensure active participation in the Communication Tests and the preparation for the Tsunami Exercises,
- provide their tsunami forecast points, if they have not done so,
- nominate experts to the Working Groups and the Task Teams,
- consider extra-budgetary and in-kind contributions to IOC in support of NEAMTWS, including the NEAMTIC;

Requests the Co-chairs of the Working Groups and of the Task Teams to prepare, in consultation with the Members of their respective Working Groups or Task Teams, a plan of action for the intersessional period and submit it to the IOC Secretariat, if they have not already done so, no later than the end of January 2011;

Thanks Spain for the offer to host the eighth session and **decides** to organize it in Santander from 23 to 25 November 2011.

Annex II.A

Terms of Reference of the Task Team on the Regional Tsunami Warning System Architecture

Mandate

Taking account of the NEAMTWS implementation plan, the Interim Operational Users Guide and the Development Plan, the outcomes of working groups and task teams, and of the previous decisions made by the ICG and the work carried out formerly, the Task Team shall:

1. Continue to refine architecture, tools and cooperation for RTWCs, as elements of the technical end-to-end operational structure of the NEAMTWS,
2. Maintain and update the Development Plan and Operational Users guide for the NEAMTWS network.

Modus operandi

The Task Team will mainly work by correspondence, but hold a first meeting at the beginning of 2011 and a final one, in preparation for the next ICG meeting. Other meetings will be held as needed.

Membership

- The ICG officers and the chairpersons of the ICG working groups
- Representatives of potential RTWCs
- Experts designated by Member States having interest in participating in the system
- Representatives of relevant organizations working in the NEAMTWS region

The Task Team will have two co-chairs nominated by the Officers of the ICG/NEAMTWS.

Annex II.B

Terms of Reference of the Task Team on the Communication Test and Tsunami Exercises

Mandate

As part of the preparations phase for the NEAMTWS the Task Team on Communication Test and Tsunami Exercises will:

1. Refine procedures for testing the communication of tsunami alert messages between National Tsunami Warning Centres and Tsunami Warning Focal Points, including speed and availability within NEAMTWS region;
2. Conduct a Workshop ahead of the enlarged Communication Test to inform about the procedures and discuss the practical means of the Tsunami Exercise in 2012. Participants: NTWC, TWFPs, TNCs, Civil Protection authorities, IT experts, representatives of relevant organizations working in the NEAMTWS region;

3. Prepare and conduct the test and organize its assessment;
4. Contribute to reviewing and proposing amendments to the relevant parts of the Operational Users Guide in the light of experience with the tests;
5. Based on experience gained, set-up procedures for the first NEAM Tsunami exercise to be conducted in 2012;
6. Report to ICG/NEAMTWS-VIII.

Modus operandi

The Task Team will mainly work by correspondence, but hold a first meeting at the beginning of 2011 and a final one, in preparation for the next ICG meeting. Other meetings will be held as needed.

The offer of JRC to host the workshop is acknowledged.

Membership

- The ICG officers
- Chairs or co-chairs of existing NEAMTWS Task Teams and Working Groups
- Representatives of potential RTWCs
- Experts designated by Member States having interest in participating in the system (NTWC, TWFP, TNC, Civil Protection authorities)
- Representatives of relevant organizations working in the NEAMTWS region

The Task Team Co-chairs will be nominated by the Officers of the ICG/NEAMTWS.

Annex II.C

Task Team on the Multi-hazard Approach to Coastal Inundation

Mandate

Taking account of encouragement by EC-XLIII and TOWS to develop a multi-hazard (MH) approach to tsunami warning systems, where appropriate, the Task Team shall:

1. Identify, in collaboration with relevant bodies, existing national sea-level related warning and mitigation systems in the NEAM region;
2. Explore ways of linking or integrating national tsunami warning functions and existing or planned multi-hazard systems, using the experience gained across NEAM and other ICGs;
3. Consider how multi-hazard systems could include prevention, awareness and mitigation aspects of NEAMTWS;
4. Explore linkages with existing frameworks for coastal inundation mapping such as, but not restricted to, the EU Floods Directive and the Integrated Coastal Zone Management Protocol of the Barcelona Convention;
5. Make specific proposals to ICG/NEAMTWS-VIII for implementation of NEAMTWS functions in a MH framework.

Modus operandi

The Task Team will mainly work by correspondence, but hold a first meeting in the beginning of 2011 in Paris and a final one, in preparation for the next ICG meeting.

Membership

- The ICG officers and the chairpersons of Working Groups 3 and 4
- Representatives of NTWCs
- Experts designated by Member States having interest in participating in the system, including particularly representatives of civil protection authorities
- Representatives of relevant organizations working in the NEAMTWS region

The Task Team will have one chair nominated by the Officers of the ICG/NEAMTWS.

ANNEX III

LIST OF DOCUMENTS

Working Documents

Agenda Item	Code	Title
2.1	ICG/NEAMTWS-VII/1 Prov.	Provisional Agenda
2.1	ICG/NEAMTWS-VII/2 Prov.	Provisional Annotated Agenda
2.3	ICG/NEAMTWS-VII 1 Prov. Add.	Provisional Timetable
	ICG/NEAMTWS-VII/3	Summary Report
2.3	ICG/NEAMTWS-VII/4	Provisional List of Documents
	ICG/NEAMTWS-VII/5	Provisional List of Participants
3.2		Report of the Secretariat incl. status of the TNC/TWFP nominations, sea level stations and forecast points
3.3	Resolution XXV-13	Global Coordination of Early Warning and Mitigation Systems for Tsunamis and Other Sea-Level Related Hazards
3.3	TOWS-WG-III/3	Summary report of the 3 rd meeting of Working Group on Tsunamis and Other Ocean Hazards Related to Sea Level Warning and Mitigation Systems (TOWS-WG), Lisbon, Portugal, 5–6 May 2010
3.4		Reports of the Working Groups on their intersessional activities
3.4		Reports of the Task Teams on intersessional activities
3.4	ICG/NEAMTWS-TT1-VI/3	Report of the 6th meeting of the Task Team on the Regional TWS Architecture
3.4	ICG/NEAMTWS-TT2-II/3	Report of the 2nd meeting of the Task Team on Communication
4.2		Draft Terms of Reference for a Tsunami Information Centre function
4.3	IOC Technical Series 73	Implementation Plan for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), 2007–2011 (version 3.4)
4.3		Draft Interim Operations Guide

Information Documents

Agenda Item	Code	Title
	IOC/CL/2357 Resolution XXIII-14	Circular Letter 2357 Invitation to ICG/NEAMTWS-VII Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS)
	ICG/NEAMTWS-I/3	Report of the 1st Session of the ICG/NEAMTWS (Rome, 2005)
	ICG/NEAMTWS-II/3	Report of the 2nd Session of the ICG/NEAMTWS (Nice, 2006)
	ICG/NEAMTWS-III/3	Report of the 3rd Session of the ICG NEAMTWS (Bonn, 2007)
	ICG/NEAMTWS-IV/3 rev.	Report of the 4th Session of the ICG/NEAMTWS (Lisbon, 2007)
	ICG/NEAMTWS-V/3	Report of the 5th Session of the ICG/NEAMTWS (Athens, 2008)
	ICG/NEAMTWS-VI/3	Report of the 6th Session of the ICG/NEAMTWS (Istanbul, 2009)
3.4	IOC/TOWS-WG-I/3	Summary Report of the 1st meeting of TOWS-WG
3.4	IOC/TOWS-WG-II/3	Summary Report of the 2nd meeting of TOWS-WG
3.4		Terms of Reference for NEAMTWS Working Groups and Task Team

ANNEX IV

REPORTS ON THE INTERSESSIONAL ACTIVITIES OF THE WORKING GROUPS

Working Group 1 – Hazard assessment

After the ICG/NEAMTWS-VI meeting in Istanbul, Turkey, 11-13 November 2009, a work plan for the intersessional period was formulated with the following items:

1. Organize an intersessional meeting, possibly co-located with the EGU Meeting in Vienna, May 3-7, 2010.
2. Review of state of implementation plan and derivation of overdue action items with responsibilities
3. Finalize and approve standards for model validation
4. Finalize and approve standards for model output
5. Work on concept with WG4 for exchanging modelling results for vulnerability and risk assessment
6. Work on concept for technical data harmonization and data sharing between RTWPs
7. Work on concept for integration of modelling in multi-hazard warning systems

Unfortunately, due to poor attendance, an intersessional meeting could not take place, in spite of several attempts. Thus, some of the work plan items could not be tackled in the anticipated way.

However, progress has been made in a number of aspects.

1. Contributions could be acknowledged from the SAFER project as well as the TRANSFER project, both funded by EU grants and both finished by the time of writing this report. Together with results from other EU projects and out of other ICG regions (e.g. IOTWS), a number of methodologies for deriving hazard and risk maps are on the market now, and it will be the task of future coordination work to homogenize these approaches or at least extract common standards.
2. A revision of the decision matrix has been proposed and was circulated to the WG1 contacts. It will be discussed and endorsed during the sessional meeting of WG1. The reason for this revision comes from recent research and experience, suggesting a modification of the hazard zone close to the coast.
3. WG4 has proposed a Guide for Public Awareness, Preparedness and Mitigation, and asked WG1's contributions. The WG1 co-chair worked together with the authors of the guide.
4. Final versions of the Model validation guide and the data formats guide have been circulated to WG1 contacts and it will be on the agenda to finally endorse these guidelines at the sessional meeting.

An extract of open issues of the implementation plan is attached to this document. It will be the task of WG1 sessional meeting participants to revise the implementation plan accordingly.

APPENDIX 1

Open issues in the WG1 Implementation plan

Task/Action	Timeline	Responsibility	Required Budget	Status¹
Decision Matrix to classify local, regional and basin tsunamis (criteria in magnitude, depth, focal mechanism) Revision	NEAMTWS-VII	Greece Italy, Portugal, Spain France		O/C
Adopt standards for model validation for the NEAMTWS system	NEAMTWS-VII	Germany		O/C
Adopt standards for model output parameters for the NEAMTWS system	NEAMTWS-VII	TRANSFER, Turkey, Spain, Germany		O/C
Provision of data of the historical seismic and tsunami events (seismic parameters, topo-bathymetry, sea level data, run-up....) Portugal 1755, Messina 1908, Greece 1956, Izmit 1999, Algeria – Balearic 2003	NEAMTWS-IV 2011	WG3 (Sea level) Portugal, Italy, Greece, Turkey, France, Algeria, Spain		O
Report subduction zone of the Greek islands	Sept. 2009	Greece		O
Credible scenario for all other areas	2010	Member States TRANSFER		O
Methodology of coastal vulnerability assessment	NEAMTWS-VII	WG4		O/C
Inventory of available bathymetries (emphasis on shallow water < 100 m)	NEAMTWS-IV	Contribution : MS IOC – IHO		O
Inventory of available topographies and land usage maps	2009	MS		O
Make topo-bathymetric data available	NEAMTWS-IV	MS		O
Benchmarks case computation Lisbon 1755, Messina 1908	NEAMTWS-IV			O
Sensitivity analysis	2009	TRANSFER		O/C
Tsunami source and hazard assessment (examples, priority regions, etc.)	2009	TRANSFER, MS		O/C
Concept for technical data harmonization and data sharing between RTWPs	Beyond NEAMTWS-VII	WG1, WG4, TT		P
Concept for integration of modelling in multi-hazard warning systems	Beyond NEAMTWS-VII	WG1, TT		P

1 Notes: – Status: P – Planned, C – Completed, O – Ongoing, O/C – Ongoing but to be completed by NEAMTWS-VII

Working Group 4 - Public Awareness, Preparedness and Mitigation

New ToR – Working Group 4 (modified by ICG/NEAMTWS VI in Istanbul)

The Working Group will advise on the assessment of vulnerability and risk to communities in respect of tsunami events; on procedures for enhancing awareness of, and preparedness for, tsunami impacts including evacuation planning and education; on the receipt and interpretation of tsunami alert messages received from Regional Tsunami Watch Centres by Tsunami Warning Focal Points and National Tsunami Warning Centres for issuance of warnings to threatened communities; and on the options in an Integrated Coastal Area Management (ICAM) context for the mitigation of risk to communities in respect of tsunami impacts.

Report on Intersessional activities

Progress on the activities listed in the WG's revised Action Plan for this Intersessional period (see Annex) following the adoption by the ICG/NEAMTWS-VI in Istanbul of the WG's new ToR is as follows:

1. There has been no further progress in engagement with the EC Environment, Water and Civil Protection units. Each unit was requested to comment on the First Draft of the Guidance Manual.
2. A Guidance Manual for Civil Protection Authorities in respect of tsunami risk assessment and mitigation has been completed to Second Draft stage. The manual is entitled "Reducing and Managing the Risk of Tsunamis". The Second Draft incorporates responses to comments from a comprehensive review of the First Draft by UN/ISDR. The Second Draft has been made available to the Secretariat for posting as a document for this meeting.
3. The WG has been represented and contributed to the TT on the Regional Architecture of the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS-TT1), including revision of the Interim Operational Users Guide.
4. There has been no progress on a regional review of practices for strategic mitigation responses in the context of ICAM.
5. The proposal for a training course in Awareness, Preparedness and Mitigation for Hotel Owners Association in Algarve, Portugal has been cancelled.
6. There has been no progress to report in regard to the NEAMTIC at the ICG Secretariat.
7. Liaison with the working groups in the other ICGs covering Disaster Preparedness and Mitigation has been established and maintained through the TOWS-WG.

Russell Arthurton
Stefano Tinti
Co-Chairs ICG/NEAMTWS Working Group 4
Public Awareness, Preparedness and Mitigation
6 November 2010

APPENDIX 2

Proposed actions for WG4 for Interessional period post-ICG VI

Activity	Country/ Location	Timeline	Responsibility	Required Budget	Status
1) Liaise with and establish concordance with European Commission and Member States in respect of tsunami hazard and risk mapping, the EU Floods Directive (include storm surge hazard also) and the MIC	EC	2010	IOC		O
2) Liaise with, and provide advice to, MS through the production of a Manual on Tsunami Risk Assessment and Mitigation and on the procedures for interpreting and relaying tsunami alert messages received by National Warning Centres (event timings, geographical relevance, etc.) for the issuance of warnings to threatened communities	All MS	2010-11	IOC		C
3) Contribute to the NEAMTWS Operations Users Guide in respect of emergency procedures in the event of a tsunami alert		2010-11	IOC		O
4) Contribute to a regional review of practices for strategic mitigation responses in the context of ICAM	All MS	2010-12	IOC		P
5) Prepare a Training Manual and conduct a training course in Awareness, Preparedness and Mitigation for Hotel Owners Association in Algarve, Portugal	Portugal	2010	Portugal, IOC		Cancelled
6) WG 4 to liaise with the NEAMTIC when this is established at the ICG Secretariat in Bonn		TBD			P
7) Establish and maintain liaison with the working groups in the other ICGs covering Awareness, Preparedness and Mitigation					O

Notes: – Status: P – Planned, C – Completed, O – Ongoing

Decision Matrix for the Mediterranean

Depth	Epicenter Location	Mw	Tsunami Potential	Type of Bulletin		
< 100 km	Offshore or close to the coast (≤ 40 km inland)	5.5 to 6.0	weak potential of local tsunami	Local Tsunami Advisory	Information Bulletin	Information Bulletin
		6.0 to 6.5	Potential of destructive local tsunami < 100 km	Local Tsunami Watch	Regional Tsunami Advisory	Information Bulletin
	Offshore or close to the coast (≤ 100 km inland)	6.5 to 7.0	Potential of destructive regional tsunami < 400 km	Local Tsunami Watch	Regional Tsunami Watch	Basin-wide Tsunami Advisory
		> 7.0	Potential of destructive tsunami in the whole basin > 400 km	Local Tsunami Watch	Regional Tsunami Watch	Basin-wide Tsunami Watch
> 100 km	Offshore or inland (≤ 100 km)	> 5.5	Nil	Information Bulletin	Information Bulletin	Information Bulletin
No message if the earthquake is localized inland beyond 100 km distance						

Decision Matrix for the North-eastern Atlantic (to be agreed in March during the TT)

ANNEX V

NOMINATED TNCS AND TWFPs AS OF 22 NOVEMBER 2010

Member State	TNC	TWFP
BELGIUM		Algemene Directie Crisiscentrum*†
BULGARIA	Bulgarian Institute of Oceanology (BAS)	Bulgarian Institute of Oceanology (BAS)
CAPE VERDE	Instituto Nacional de Meteorologia e Geophísica	Instituto Nacional de Meteorologia e Geophísica
CROATIA	Institute of Oceanography and Fisheries*†	
CYPRUS	Cyprus Oceanography Centre, University of Cyprus*	Cyprus Oceanography Centre, University of Cyprus*
DENMARK	Danish Meteorological Institute	Danish Meteorological Institute
EGYPT	National Research Institute of Astronomy and Geophysics (NRIAG)	National Research Institute of Astronomy and Geophysics (NRIAG)
	National Institute of Oceanography and Fisheries (NIOF)	
ESTONIA	Estonian Marine Institute, University of Tartu*	Estonian Marine Institute, University of Tartu*
FINLAND	Finnish Institute of Marine Research	Monitoring Center for Natural Disasters, Finnish Meteorological Institute
FRANCE	Ministère de l'Ecologie, du Développement et de l'Aménagement Durables	Laboratoire de Géophysique, Commissariat à l'Energie Atomique (CEA)
GERMANY	Federal Maritime and Hydrographic Agency (BSH)	
GREECE	Technical University of Crete, Department of Environmental Engineering*	National Observatory of Athens (NOA)*
	National Observatory of Athens (NOA)*	
IRELAND	Geological Survey of Ireland*	
ISRAEL	Israel Oceanographic and Limnological Research*	
ITALY	Dipartimento della Protezione Civile	Dipartimento della Protezione Civile
LEBANON	Geophysical National Center, National Council for Scientific Research*	Geophysical National Center, National Council for Scientific Research*
MALTA	Ministry of Foreign Affairs*	Ministry of Foreign Affairs*
MONACO	Centre Scientifique de Monaco	Compagnie des Sapeurs-Pompiers de Monaco
NETHERLANDS		KNMW Royal Netherlands Meteorological Institute
NORWAY		Directorate for Civil Protection and Emergency Planning (DSB)
POLAND		National Centre for Coordination of Rescue Operations and Protection of Population, National Headquarters of the State Fire Service
PORTUGAL	Instituto de Meteorologia	Instituto de Meteorologia
ROMANIA	National Institute for Earth Physics	National Institute for Earth Physics
RUSSIAN FEDERATION	State Institute Research and Production Association "Typhoon"	State Institute Research and Production Association "Typhoon"

Member State	TNC	TWFP
SLOVENIA	Environmenta Agency of the Republic of Slovenia (EARS)	
SPAIN	Instituto Español de Oceanografía	Jefe del Area de Riesgos Naturales, Dirección General de Protección Civil y Emergencias
SYRIA	Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology	Syrian Wireless Organization (SWO), Ministry of Telecommunication and Technology
TURKEY	Kandilli Observatory and Earthquake Research Institute (KOERI)	Kandilli Observatory and Earthquake Research Institute (KOERI)
UKRAINE	Marine Hydrophysical Institute, National Academy of Sciences of Ukraine*†	
UNITED KINGDOM	National Oceanographic Centre (NOC)	Humanitarian Operations, Department for International Development (DFID)

Bold: all information provided

* Official form not provided

† Validation needed through either the Permanent Delegate to UNESCO, the Head of the UNESCO National Commission or the Minister of Foreign Affairs

ANNEX VI

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ANNEX VII

LIST OF ACRONYMS

CAM	Coastal Area Management
CEA	Commissariat à l'Energie Atomique (France)
CNRS	Centre national de la recherche scientifique (France)
CNRST	Conseil National de la Recherche Scientifique et Technique (France)
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organization
DG	Directorate-General (E.U.)
DBCP	Data Buoy Cooperation Panel
DPC	Dipartimento della Protezione Civile
EC	European Commission
ETA	estimated tsunami arrival time
EU	European Union
FAFA	Financial and Administrative Framework Agreement
FFCUL	Fundação da Faculdade de Ciências da Universidade de Lisboa (Portugal)
GDDA-ERD	General Directorate for Disaster Affairs, Earthquake Research Department
GEBCO	General Bathymetric Chart of the Oceans
GFZ	GeoForschungsZentrum/National Research Centre for Geosciences (Germany)
GLOSS	Global Sea Level Observing System
GPRS	General Packet Radio Service
GTS	Global Telecommunication System
ICG	Intergovernmental Coordination Group (IOC)
ICG/NEAMTWS	Intergovernmental Coordination Group/Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas
IHO	International Hydrographic Organization
IM	Institute of Meteorology
INGV	Italian Institute of Geology and Vulcanology/Istituto Nazionale di Geofisica e Vulcanologia
IOC	Intergovernmental Oceanographic Commission (UNESCO)
ITIC	International Tsunami Information Centre
JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology (WMO-IOC)
JRC	Joint Research Centre (EC)
KOERI	Kandilli Observatory and Earthquake Research Institute (Turkey)
MBSHC	Mediterranean and Black Sea Hydrographic Commission

MedNet	Mediterranean Network
MTA	maximum tsunami amplitude
METU	Middle East Technical University
NATO	North Atlantic Treaty Organization
NEAMTIC	Tsunami Information Centre for the Euro-Mediterranean
NTWC	National Tsunami Watch Centres
PTWS	Pacific Tsunami Warning System
RTWC	Regional Tsunami Watch Centres
TNC	Tsunami National Contact
TOWS	Tsunami and Other Ocean Hazards Warning and Mitigation Systems
TUDES	Turkish National Tide-Gauge Network
TWFP	Tsunami Warning Focal Point
TWS	Tsunami Warning System
SPO	State Planning Organization
ISPRA	High Institute for Environmental Protection and Research
UNDP	United Nations Development Programmes
UNESCO	United Nations Educational Scientific and Cultural Organisation
UN/ISDR	United Nations International Strategy for Disaster Reduction
VPN	Virtual Private Network
WG	Working Group
WMO	World Meteorological Organization

In this Series	Languages
Reports of Governing and Major Subsidiary Bodies , which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:	
1. Eleventh Session of the Working Committee on international Oceanographic Data Exchange	E, F, S, R
2. Seventeenth Session of the Executive Council	E, F, S, R, Ar
3. Fourth Session of the Working Committee for Training, Education and Mutual Assistance	E, F, S, R
4. Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S, R
5. First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E, F, S
6. Third Session of the <i>ad hoc</i> Task team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime	E, F, S, R
7. First Session of the Programme Group on Ocean Processes and Climate	E, F, S, R
8. Eighteenth Session of the Executive Council	E, F, S, R, Ar
9. Thirteenth Session of the Assembly	E, F, S, R, Ar
10. Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific	
11. Nineteenth Session of the Executive Council, Paris, 1986	E, F, S, R, Ar
12. Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S
13. Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange	E, F, S, R
14. Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Havana, 1986	E, F, S
15. First Session of the IOC Regional Committee for the Central Eastern Atlantic, Praia, 1987	E, F, S
16. Second Session of the IOC Programme Group on Ocean Processes and Climate	E, F, S
17. Twentieth Session of the Executive Council, Paris, 1987	E, F, S, R, Ar
18. Fourteenth Session of the Assembly, Paris, 1987	E, F, S, R, Ar
19. Fifth Session of the IOC Regional Committee for the Southern Ocean	E, F, S, R
20. Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Beijing, 1987	E, F, S, R
21. Second Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Arusha, 1987	E, F
22. Fourth Session of the IOC Regional Committee for the Western Pacific, Bangkok, 1987	E only
23. Twenty-first Session of the Executive Council, Paris, 1988	E, F, S, R
24. Twenty-second Session of the Executive Council, Paris, 1989	E, F, S, R
25. Fifteenth Session of the Assembly, Paris, 1989	E, F, S, R
26. Third Session of the IOC Committee on Ocean Processes and Climate, Paris, 1989	E, F, S, R
27. Twelfth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Novosibirski, 1989	E, F, S, R
28. Third Session of the Sub-Commission for the Caribbean and Adjacent Regions, Caracas, 1989	E, S
29. First Session of the IOC Sub-Commission for the Western Pacific, Hangzhou, 1990	E only
30. Fifth Session of the IOC Regional Committee for the Western Pacific, Hangzhou, 1990	E only
31. Twenty-third Session of the Executive Council, Paris, 1990	E, F, S, R
32. Thirteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, New York, 1990	E only
33. Seventh Session of the IOC Committee for the Global Investigation of Pollution in the Marine Environment, Paris, 1991	E, F, S, R
34. Fifth Session of the IOC Committee for Training, Education and Mutual Assistance in Marine Sciences, Paris, 1991	E, F, S, R
35. Fourth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1991	E, F, S, R
36. Twenty-fourth Session of the Executive Council, Paris, 1991	E, F, S, R
37. Sixteenth Session of the Assembly, Paris, 1991	E, F, S, R, Ar
38. Thirteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Baja California, 1991	E, F, S, R
39. Second Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1992	E only
40. Twenty-fifth Session of the Executive Council, Paris, 1992	E, F, S, R
41. Fifth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1992	E, F, S, R
42. Second Session of the IOC Regional Committee for the Central Eastern Atlantic, Lagos, 1990	E, F
43. First Session of the Joint IOC-UNEP Intergovernmental Panel for the Global Investigation of Pollution in the Marine Environment, Paris, 1992	E, F, S, R
44. First Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1992	E, F, S
45. Fourteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 1992	E, F, S, R
46. Third Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Vascoas, 1992	E, F
47. Second Session of the IOC Sub-Commission for the Western Pacific, Bangkok, 1993	E only
48. Fourth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Veracruz, 1992	E, S
49. Third Session of the IOC Regional Committee for the Central Eastern Atlantic, Dakar, 1993	E, F
50. First Session of the IOC Committee for the Global Ocean Observing System, Paris, 1993	E, F, S, R
51. Twenty-sixth Session of the Executive Council, Paris, 1993	E, F, S, R
52. Seventeenth Session of the Assembly, Paris, 1993	E, F, S, R
53. Fourteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Tokyo, 1993	E, F, S, R
54. Second Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1993	E, F, S
55. Twenty-seventh Session of the Executive Council, Paris, 1994	E, F, S, R
56. First Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Melbourne, 1994	E, F, S, R
57. Eighth Session of the IOC-UNEP-IMO Committee for the Global Investigation of Pollution in the Marine Environment, San José, Costa Rica, 1994	E, F, S
58. Twenty-eighth Session of the Executive Council, Paris, 1995	E, F, S, R
59. Eighteenth Session of the Assembly, Paris, 1995	E, F, S, R
60. Second Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E, F, S, R

61.	Third Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1995	E only
62.	Fifteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Papete, 1995	E, F, S, R
63.	Third Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1995	E, F, S
64.	Fifteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange	E, F, S, R
65.	Second Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E only
66.	Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996	E only
67.	Fifth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Christ Church, 1995	E, S
68.	Intergovernmental Meeting on the IOC Black Sea Regional Programme in Marine Sciences and Services	E, R
69.	Fourth Session of the IOC Regional Committee for the Central Eastern Atlantic, Las Palmas, 1995	E, F, S
70.	Twenty-ninth Session of the Executive Council, Paris, 1996	E, F, S, R
71.	Sixth Session for the IOC Regional Committee for the Southern Ocean and the First Southern Ocean Forum, Bremerhaven, 1996	E, F, S,
72.	IOC Black Sea Regional Committee, First Session, Varna, 1996	E, R
73.	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Fourth Session, Mombasa, 1997	E, F
74.	Nineteenth Session of the Assembly, Paris, 1997	E, F, S, R
75.	Third Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1997	E, F, S, R
76.	Thirtieth Session of the Executive Council, Paris, 1997	E, F, S, R
77.	Second Session of the IOC Regional Committee for the Central Indian Ocean, Goa, 1996	E only
78.	Sixteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Lima, 1997	E, F, S, R
79.	Thirty-first Session of the Executive Council, Paris, 1998	E, F, S, R
80.	Thirty-second Session of the Executive Council, Paris, 1999	E, F, S, R
81.	Second Session of the IOC Black Sea Regional Committee, Istanbul, 1999	E only
82.	Twentieth Session of the Assembly, Paris, 1999	E, F, S, R
83.	Fourth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1999	E, F, S, R
84.	Seventeenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Seoul, 1999	E, F, S, R
85.	Fourth Session of the IOC Sub-Commission for the Western Pacific, Seoul, 1999	E only
86.	Thirty-third Session of the Executive Council, Paris, 2000	E, F, S, R
87.	Thirty-fourth Session of the Executive Council, Paris, 2001	E, F, S, R
88.	Extraordinary Session of the Executive Council, Paris, 2001	E, F, S, R
89.	Sixth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, San José, 1999	E only
90.	Twenty-first Session of the Assembly, Paris, 2001	E, F, S, R
91.	Thirty-fifth Session of the Executive Council, Paris, 2002	E, F, S, R
92.	Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Lisbon, 2000	E, F, S, R
93.	Eighteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Cartagena, 2001	E, F, S, R
94.	Fifth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2001	E, F, S, R
95.	Seventh Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Mexico, 2002	E, S
96.	Fifth Session of the IOC Sub-Commission for the Western Pacific, Australia, 2002	E only
97.	Thirty-sixth Session of the Executive Council, Paris, 2003	E, F, S, R
98.	Twenty-second Session of the Assembly, Paris, 2003	E, F, S, R
99.	Fifth Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Kenya, 2002 (* Executive Summary available separately in E, F, S & R)	E*
100.	Sixth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, St. Petersburg (USA), 2002 (* Executive Summary available separately in E, F, S & R)	E*
101.	Seventeenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 2003 (* Executive Summary available separately in E, F, S & R)	E*
102.	Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2003 (* Executive Summary available separately in E, F, S & R)	E*
103.	Nineteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Wellington, New Zealand, 2003 (* Executive Summary available separately in E, F, S & R)	E*
104.	Third Session of the IOC Regional Committee for the Central Indian Ocean, Tehran, Islamic Republic of Iran, 21-23 February 2000	E only
105.	Thirty-seventh Session of the Executive Council, Paris, 2004	E, F, S, R
106.	Seventh Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2005 (* Executive Summary available separately in E, F, S & R); and Extraordinary Session, Paris, 20 June 2005	E*
107.	First Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Perth, Australia, 3-5 August 2005	E only
108.	Twentieth Session of the Intergovernmental Coordination Group for the Tsunami Warning System in the Pacific, Viña del Mar, Chile, 3-7 October 2005 (* Executive Summary available separately in E, F, S & R)	E*
109.	Twenty-Third Session of the Assembly, Paris, 21-30 June 2005	E, F, S, R
110.	First Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Rome, Italy, 21-22 November 2005	E only
111.	Eighth Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Recife, Brazil, 14-17 April 2004 (* Executive Summary available separately in E, F, S & R)	E*
112.	First Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions (ICG/CARIBE-EWS), Bridgetown, Barbados, 10-12 January 2006	E only
113.	Ninth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Cartagena de Indias, Colombia, 19-22 April 2006 (* Executive Summary available separately in E, F, S & R)	E S*

114.	Second Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Hyderabad, India, 14–16 December 2005	E only
115.	Second Session of the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology, Halifax, Canada, 19–27 September 2005 (Abridged final report with resolutions and recommendations)	E, F, R, S
116.	Sixth Session of the IOC Regional Committee for the Western Indian Ocean (IOCWIO), Maputo, Mozambique, 2–4 November 2005 (* Executive Summary available separately in E, F, S & R)	E*
117.	Fourth Session of the IOC Regional Committee for the Central Indian Ocean, Colombo, Sri Lanka 8–10 December 2005 (* Executive Summary available separately in E, F, S & R)	E*
118.	Thirty-eighth Session of the Executive Council, Paris, 20 June 2005 (Electronic copy only)	E, F, R, S
119.	Thirty-ninth Session of the Executive Council, Paris, 21–28 June 2006	E, F, R, S
120.	Third Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Bali, Indonesia, 31 July–2 August 2006 (*Executive Summary available separately in E,F,S & R)	E*
121.	Second Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Nice, France, 22–24 May 2006	E only
122.	Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 16–18 March 2005 (* Executive Summary available separately in E, F, S & R)	E*
123.	Fourth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-IV), Mombasa, Kenya, 30 February-2 March 2007 (* Executive Summary available separately in E, F, S & R)	E*
124.	Nineteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Trieste, Italy, 12–16 March 2007 (* Executive Summary available separately in E, F, S & R)	E*
125.	Third Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Bonn, Germany, 7–9 February 2007 (* Executive Summary available separately in E, F, S & R)	E*
126.	Second Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Cumaná, Venezuela, 15–19 January 2007 (* Executive Summary available separately in E, F, S & R)	E*
127.	Twenty-first Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Melbourne, Australia, 3–5 May 2006 (* Executive Summary available separately in E, F, S & R)	E*
128.	Twenty-fourth Session of the Assembly, Paris, 19–28 June 2007	E, F, S, R
129.	Fourth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Lisbon, Portugal, 21–23 November 2007 (* Executive Summary available separately in E, F, S & R)	E*
130.	Twenty-second Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Guayaquil, Ecuador, 17–21 September 2007 (* Executive Summary available in E, F, S & R included)	E*
131.	Forty-first Session of the Executive Council, Paris, 24 June–1 July 2008	E, F, R, S
132.	Third Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Panama City, Panama, 12–14 March 2008 (* Executive Summary available separately in E, F, S & R)	E*
133.	Eighth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 17–20 April 2007 (* Executive Summary available separately in E, F, S & R)	E*
134.	Twenty-third Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Apia, Samoa, 16–18 February 2009 (*Executive Summary available separately in E, F, S & R)	E*
135.	Twentieth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Beijing, China, 4–8 May 2009 (*Executive Summary available separately in E, F, S & R)	E*
136.	Tenth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Puerto La Cruz, Bolivarian Republic of Venezuela, 22–25 October 2008 (*Executive Summary available separately in E, F, S & R)	E, S*
137.	Seventh Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VII), Sabah, Malaysia, 26–29 May 2008 (*Executive Summary available separately in E, F, S & R)	E*
138.	Ninth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, France, 10–12 June 2009 (* Executive Summary available separately in E, F, S & R);	E*
139.	Fifth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Athens, Greece, 3–5 November 2008 (* Executive Summary available separately in E, F, S & R)	E*
140.	Fourth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Fort-de-France, Martinique, France, 2–4 June 2009 (* Executive Summary available separately in E, F, S & R)	E*
141.	Twenty-fifth Session of the Assembly, Paris, 16–25 June 2009	E, F, R, S
142.	Third Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology, Marrakesh, Morocco, 4–11 November 2009	E, F, R, S
143.	Ninth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 22–24 April 2009 (* Executive Summary available separately in E, F, S & R)	E*
144.	Fifth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Managua, Nicaragua, 15–17 March 2010 (* Executive Summary available in E, F, S & R)	E*
145.	Sixth Session of the IOC Regional Committee for the Central and Eastern Atlantic Ocean, Accra, Ghana, 28–30 March 2010 (* Executive Summary available in E, F, S & R)	E*
146.	Forty-second Session of the Executive Council; Paris, 15, 19 & 20 June 2009	E, F, R, S
147.	Forty-third Session of the Executive Council; Paris, 8–16 June 2010	E, F, R, S
148.	Sixth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Istanbul, Turkey, 11–13 November 2009 (* Executive Summary available separately in Ar, E, F, S & R)	E*
149.	Seventh Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Paris, France, 23–25 November 2010 (* Executive Summary available separately in Ar, E, F, S & R)	E*